

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims

1. (Previously Presented) In an Ethernet network, a method of mapping an original Media Access Control (MAC) address to a unique locally administered virtual MAC address, said method comprising the steps of:

utilizing a first portion of the virtual MAC address to define a MAC domain for the address;

utilizing a second portion of the virtual MAC address to indicate that the address is a locally administered address;

utilizing a third portion of the virtual MAC address to indicate a unit-specific use; and

utilizing a fourth portion of the virtual MAC address to indicate an organizationally assigned unit-unique MAC address;

wherein the step of utilizing a first portion of the virtual MAC address to define a MAC domain for the address includes defining different MAC domains for units that have the same unit-unique MAC address, thereby ensuring each unit has a unique locally administered virtual MAC address.

2. (Previously Presented) In an Ethernet network, a method of mapping an original Media Access Control (MAC) address to a unique locally administered virtual MAC address, said method comprising the steps of:

utilizing a first portion of the virtual MAC address to define a MAC domain for the address;

utilizing a second portion of the virtual MAC address to indicate that the address is a locally administered address;

utilizing a third portion of the virtual MAC address to indicate a unit-specific use; and

utilizing a fourth portion of the virtual MAC address to indicate an organizationally assigned unit-unique MAC address;

wherein the unique locally administered virtual MAC address includes six octets, and wherein:

the step of utilizing a first portion of the virtual MAC address to define a MAC domain for the address utilizes the six most significant bits of the first octet of the virtual MAC address to define the domain; and

the step of utilizing a second portion of the virtual MAC address to indicate that the address is a locally administered address utilizes the second-least significant bit of the first octet of the virtual MAC address to indicate that the address is a locally administered address.

3. (Original) The method of claim 2, wherein the step of utilizing a third portion of the virtual MAC address to indicate the unit-specific use includes utilizing the second and third octets of the virtual MAC address to indicate the unit-specific use.

4. (Original) The method of claim 3, wherein the step of utilizing the second and third octets of the virtual MAC address to indicate the unit-specific use includes utilizing fields within the second and third octets to indicate a line number for each user, a Permanent Virtual Circuit (PVC) for each user, and an index for each virtual MAC address utilized for each PVC.

5. (Original) The method of claim 1, wherein different nodes are assigned different Organizationally Unique Identifiers (OUIs), and the step of utilizing a first portion of the virtual MAC address to define a MAC domain for the address includes defining a different domain for each assigned OUI.

6. (Previously Presented) The method of claim 1, wherein the step of utilizing a first portion of the node's locally administered MAC address to define a MAC domain includes the steps of:

comparing the unit-unique MAC address against unit-unique MAC addresses that are already used in other nodes; and

if the unit-unique MAC address has already been used in another node, defining a new MAC domain for the virtual MAC address.

7. (Original) The method of claim 6, wherein the step of comparing the unit-unique MAC address against unit-unique MAC addresses that are already used in other nodes includes accessing a MAC address database that stores MAC addresses for all nodes in the network.

8. (Original) The method of claim 1, wherein the original MAC address is received by an address mapping function that maps original MAC addresses from Ethernet packets to one of a plurality of assigned locally administered virtual MAC addresses.

9. (Currently Amended) In an Ethernet network, ~~a system~~ an access node for mapping an original Media Access Control (MAC) address to a unique locally administered virtual MAC address, said ~~system~~ access node comprising:

~~at least one address mapping function that maps original MAC addresses to one of a plurality of assigned locally administered virtual MAC addresses;~~

means for receiving an Ethernet frame having an original MAC address;

~~means within the mapping function for~~ defining a MAC domain for the virtual MAC address utilizing a first portion of the virtual MAC address ~~to define a MAC domain for the virtual MAC address;~~

~~means within the mapping function for~~ indicating that the address is a locally administered address utilizing a second portion of the virtual MAC address ~~to indicate that the address is a locally administered address;~~

~~means within the mapping function for~~ denoting a unit-specific use utilizing a third portion of the virtual MAC address; ~~to denote a unit-specific use; and~~

~~means within the mapping function for denoting an organizationally assigned unit-unique MAC address~~ utilizing a fourth portion of the virtual MAC address ~~to denote an organizationally assigned unit-unique MAC address;~~

~~means for replacing the original MAC address in the Ethernet frame with the virtual MAC address; and~~

~~means for transmitting the Ethernet frame with the virtual MAC address to a destination node utilizing the virtual MAC address;~~

wherein the means for ~~utilizing a first portion of the virtual MAC address to define~~ defining a MAC domain for the virtual MAC address includes means for defining different MAC domains for ~~units~~ nodes that have the same unit-unique MAC address, thereby ensuring each unit node has a unique locally administered virtual MAC address.

10. (Currently Amended) In an Ethernet network, ~~a system~~ an access node for mapping an original Media Access Control (MAC) address to a unique locally administered virtual MAC address, said ~~system~~ access node comprising:

~~at least one address mapping function that maps original MAC addresses to one of a plurality of assigned locally administered virtual MAC addresses;~~

~~means for receiving an Ethernet frame having an original MAC address;~~

~~means within the mapping function for defining a MAC domain for the virtual MAC address~~ utilizing a first portion of the virtual MAC address ~~to define a MAC domain for the virtual MAC address;~~

~~means within the mapping function for indicating that the address is a locally administered address~~ utilizing a second portion of the virtual MAC address ~~to indicate that the address is a locally administered address;~~

~~means within the mapping function for denoting a unit-specific use~~ utilizing a third portion of the virtual MAC address; ~~to denote a unit-specific use; and~~

~~means within the mapping function for denoting an organizationally assigned unit-unique MAC address~~ utilizing a fourth portion of the virtual MAC address ~~to denote an organizationally assigned unit-unique MAC address;~~

~~means for replacing the original MAC address in the Ethernet frame with the virtual MAC address; and~~

means for transmitting the Ethernet frame with the virtual MAC address to a destination node utilizing the virtual MAC address:

wherein the unique locally administered virtual MAC address includes six octets, and wherein the first portion of the virtual MAC address that is utilized to define the MAC domain is the six most significant bits of the first octet of the virtual MAC address.

11. (Currently Amended) The ~~system~~ access node of claim 10, wherein the second portion of the virtual MAC address that is utilized to indicate that the address is a locally administered MAC address is the second-least significant bit of the first octet of the virtual MAC address.

12. (Currently Amended) The ~~system~~ access node of claim 11, wherein the third portion of the virtual MAC address that is utilized to denote a unit specific use includes a second and third octet of the virtual MAC address.

13. (Currently Amended) The ~~system~~ access node of claim 9, further comprising:

a MAC address database ~~that stores~~ for storing unit-unique MAC addresses for all nodes in the network;

means for accessing the MAC address database and for comparing the unit-unique MAC address against unit-unique MAC addresses that are already used in other nodes; and

means within the address mapping function for defining a new MAC domain for the original MAC address if the unit-unique MAC address has already been used in another node.

14. (Previously Presented) A method of preventing subscriber spoofing in an Ethernet network comprising the steps of:

mapping an original Media Access Control (MAC) address to a locally administered virtual MAC address; and

ensuring the locally administered virtual MAC address is unique by:

utilizing a first portion of the virtual MAC address to define a MAC domain for the address;

utilizing a second portion of the virtual MAC address to indicate that the address is a locally administered address;

utilizing a third portion of the virtual MAC address to indicate a unit-specific use; and

utilizing a fourth portion of the virtual MAC address to indicate an organizationally assigned unit-unique MAC address;

wherein the step of utilizing a first portion of the virtual MAC address to define a MAC domain for the address includes defining different MAC domains for units that have the same unit-unique MAC address, thereby ensuring each unit has a unique locally administered virtual MAC address.

15-18. (Canceled)

19. (New) A computer program loaded on an internal memory of a controller of an access node of a communications system, comprising software code portions for performing the following steps when the computer program is run on a processor of the controller:

utilizing a first portion of the virtual MAC address to define a MAC domain for the address;

utilizing a second portion of the virtual MAC address to indicate that the address is a locally administered address;

utilizing a third portion of the virtual MAC address to indicate a unit-specific use; and

utilizing a fourth portion of the virtual MAC address to indicate an organizationally assigned unit-unique MAC address;

wherein the step of utilizing a first portion of the virtual MAC address to define a MAC domain for the address includes defining different MAC domains for units that have the same unit-unique MAC address, thereby ensuring each unit has a unique locally administered virtual MAC address.

20. (New) The computer program of claim 19, wherein when the computer program is run on the processor of the controller, a software code portion also performs the step of storing all assigned locally administered virtual MAC addresses in a database.

21. (New) The computer program of claim 19, wherein when the computer program is run on the processor of the controller, a software code portion also performs the step of communicating with an external database that stores all assigned locally administered virtual MAC addresses.